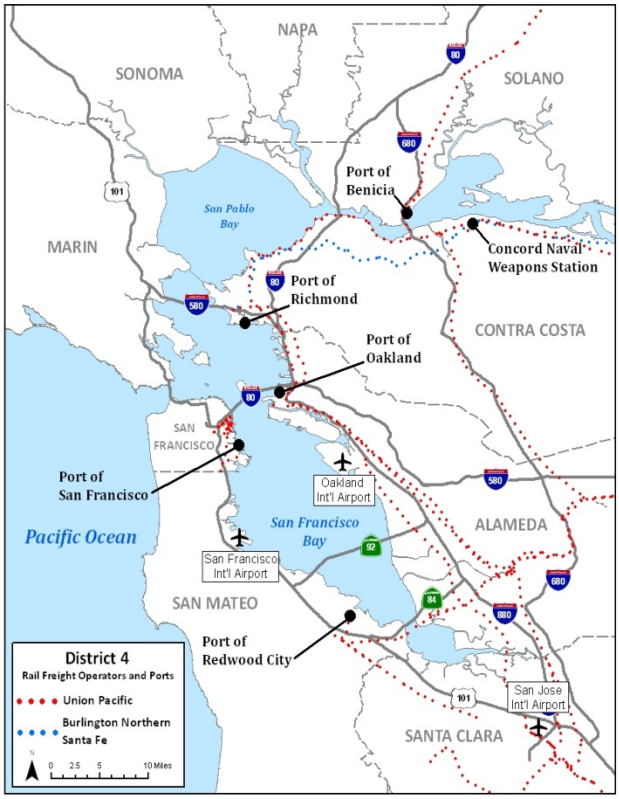
San Francisco Bay Area Region

INTRODUCTION

The San Francisco Bay Area (Bay Area), which coincides with Caltrans' District 4 boundaries, is home to the world's 19th largest economy. It covers the nine counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. Within this area there are 101 cities and towns, which are anchored by the three major metropolitan cities of San Francisco, Oakland, and San Jose. Key freight infrastructure includes five seaports, three commercial airports, two large (Class I) rail lines, and two critical corridors.



The Bay Area's unique geographical layout and strong dependence on several bridges coupled with a projected population increase from 7 million (in 2011) to 9 million (by 2040) bring their own array of major planning challenges. Additional complications facing the region include potential sea level rise and earthquake risks associated with the San Andreas Fault, which pose hazards that could devastate freight mobility throughout the region and beyond.

The Bay Area encompasses several freight generators, like the San Francisco International Airport; both the Port of Oakland and Oakland International Airport along I-880; several corporate campuses in San Mateo and Santa Clara counties; and agricultural (especially wine) production in Sonoma and Napa counties. Many goods movement generators such as manufacturing, warehousing, and distribution facilities have been forced out of urban core areas in favor of residential and other uses partially due to rising land costs. Such trends ultimately impact the efficiency of freight transportation throughout the region.

The information for this report is a conglomeration of several plans and studies (listed at the end of this report) and has been broken down by the major freight modes. Challenges, issues, needs, and solutions have been highlighted.

IMPORTANCE OF GOODS MOVEMENTS AND ECONOMIC BENEFITS

Nationally

As a major international gateway, Bay Area goods movement provides an important link to the national economy. In the 2004 Regional Goods Movement Study for the San Francisco Bay Area, approximately "37 percent of economic output is manufacturing, freight transportation, warehouse, and distribution businesses." However, the economy is continuing to shift away from manufacturing towards the service sector, especially professional, technical, and information services. As reported in the 2014 San Francisco Bay Area Freight Mobility Study (SFBAFMS):

> "In 2011, the San Francisco Customs District (which includes all of the region's seaports and airports, as well as those of Monterey County, Sacramento County, Fresno County, and Reno) reported two-way trade valued at $119.1 billion moving through its international gateways. This

makes the San Francisco Customs District the second most important trade gateway in California, the third most important gateway on the West Coast of the U.S., and the 10th largest international trade gateway in the U.S. (in terms of value of two-way trade)."

Regionally

Goods movement is also critical to the regional economy. According to the SFBAFMS, in the region, "goods movement-dependent industries spent $20.3 billion on transportation, 52 percent (approximate) of which were outsourced, while the remaining 47 percent (approximate) were in-house spending. This is equivalent to 2.1 percent of total regional output and represents 64 percent of all spending on transportation services in the region. Manufacturing industries in the Bay Area spend $9.4 billion a year on transportation, the highest of any industry group. Of this $9.4 billion, 79 percent ($7.4 billion) was spent on outsourced transportation, and 21 percent ($2 billion) was spent on in-house transportation, which is in contrast with most other industries, where the majority of transportation spending is in-house" in 2011. Goods movement not only contributes to the economic diversity of local economies, it also enhances regional competitiveness on costs of goods and services. Major domestic trading partners are Southern California, the San Joaquin Valley, and the western states.

Regional Overview

Counties	Distinguishing Characteristics
Alameda	Oakland is the County's central hub and the third largest city in the Bay Area. Home to the Port of Oakland and the Oakland International Airport, it is the region's major industrial center.
Contra Costa	This suburban county includes the Port of Richmond. The area has a number of active oil refineries and is a site for heavy industry and chemical plants. At one time, there was a substantial steel plant; however, steel is now reduced to secondary production of strip sheet and wire.
Marin	This county includes several natural sites, such as Point Reyes National Seashore and Muir Woods National Monument, and is known for its scenic beauty and affluence. It is also home to San Quentin State Prison.
Napa	Considered one of the nation's top wine producing regions, the combination of Mediterranean climate, geography and geology of the region are conducive to growing quality wine grapes and other crops. The dairy industry is also substantial. Almost 4.5 million tourists visit Napa Valley annually.
San Francisco	San Francisco is the second most densely populated major city in North America after New York City. This city and county includes the Port of San Francisco, which specializes in non-containerized cargo (dry/liquid bulk, and break-bulk, and project) and tourism.
San Mateo	This county encompasses most of the south San Francisco peninsula, including the Port of Redwood City and the San Francisco International Airport (SFO). At SFO, 56 airlines provide air cargo service, including seven cargo-only airlines. It is a major trade hub with Pacific Rim countries including China, South Korea, Japan, and Taiwan. Many of the region's bio-pharmaceutical companies are located in Alameda and San Mateo Counties. Although the region is mostly suburban, it is also has urban areas that are home to several corporate campuses.
Santa Clara	Commonly known as the "Silicon Valley", this county is located between the Santa Cruz Mountains and the Diablo Mountain Range at the southern end of San Francisco Bay. Silicon Valley is known for its high technology manufacturing and needs goods movement industrial businesses to supply and to support the industry. Strong demand for manufacturing and warehouse space in this county, combined with the scarcity of

COUNTIES	DISTINGUISHING CHARACTERISTICS
	available sites, constrains future expansion of these sectors.
Solano	Located in the Bay Area-Delta region between San Francisco and Sacramento, this county is home to the privately-owned Port of Benicia. An auto processing facility operates there.
Sonoma	Within California's Wine Country, it is the largest and northernmost county in the region, known for its agricultural productivity and as a leading tourist destination. It is one of the nation's leading centers for grape growing and wine production. While much of the wine products and supplies are moved between grape growers and vintners by truck, larger wineries are increasingly taking advantage of intermodal rail services to move large shipments of equipment and supplies.

GOODS MOVEMENT GATEWAYS, CORRIDORS, HUBS, AND FLOWS

TRUCKS – FREIGHT

In the Bay Area, trucking has the largest share of total freight movement by tonnage at 67 percent, the majority intrastate trips. A substantial amount of interregional trade is with Southern California and the San Joaquin Valley, whereas intraregional flows made up 23 percent of domestic truck movements by weight in 2011 (155 million tons). According to the SFBAFMS, area commodity flows by truck are expected to grow significantly – from 290 million tons in 2011 to 565 million tons in 2040. The region's projected increases in population and economic activity will result in increased truck movement, especially near airports and seaports.

Primary North-South Routes
I-880, US 101, I-680, and SR-29

Primary East-West Routes
I-80 (western leg of a national freight corridor; route subject to multi-state coordination efforts), I-580, SR-12, SR-152, SR-4, and SR-37

Major Freight Corridors

- **Altamont Corridor:** The highway portion of this corridor runs from the Port of Oakland (Port), along I-880, I-238, and I-580, connecting with I-5 and SR 99 at the southern end of the San Joaquin Valley. The rail portion connects the Port with transcontinental routes also in the Central Valley. This corridor links the State's agriculture commerce with the Port and also serves the growing Central Valley population. Inadequate rail capacity, especially at Niles Junction near Fremont due to conflicts between Altamont Corridor Express (ACE) passenger trains and Union Pacific (UP) freight traffic, is a major cause of chokepoints along the corridor. Expected goods movement growth along this corridor to 292 million tons by 2016 will further exacerbate rail conflicts.
- **Central Corridor:** This major east-west highway and rail corridor extends from the west to the east coast. Interstate 80, which most closely approximates the first transcontinental U.S. (Lincoln) highway, traverses several population centers such as San Francisco, Oakland, Richmond, Vallejo, Fairfield, Vacaville, Davis, Sacramento, Auburn, and Truckee before entering Nevada. I-80 terminates in Teaneck, New Jersey. In the Bay Area, this interstate highway is well known for bottlenecks. The nearly parallel rail route is primarily served by UP from the Port of Oakland to Roseville and beyond. BNSF Railway runs a limited number of trains on this corridor through trackage right agreements with Union Pacific (UP).

Truck Issues

- The Federal Highway Administration (FHWA) identified I-80 at I-580/I-880 (San Francisco-Oakland Bay Bridge approach) as among the worst freight bottlenecks in California's supply chain.
- In terms of traffic, more than 80 percent of goods movement in the Bay Area involves trucking on I-80, I-580, I-880, and US 101. In 2011, I-880 and I-580 had the highest overall truck traffic volumes in the region with I-580 being the primary interregional truck corridor. In addition to providing access to the Port and Oakland International Airport, I-880 is also one of the core intraregional highways moving goods to and from major population centers in the East Bay.
- Heavy commercial trucks with four axles or above have a greater impact on highway congestion than autos, create unique operational challenges, and cause substantial damage and wear on pavement.
- Truck idling, due to congested roadways and port entry gates, has significant adverse impacts to the region's air quality.
- The lack of truck parking in the region contributes to negative community impacts. These issues are exacerbated by a lack of specified truck routes, which leads to noise, safety, and pavement impacts when trucks travel through residential areas. Establishing designated truck routes would be a major step towards improving the region's trucking problems.

PORTS

Demand at port facilities is driven by international trade. There are four public ports in the Bay Area Region and one private port. Although not located in the region, the Port of Stockton plays an integral role in maritime cargo movement. Bay Area ports include the Port of Oakland, Port of San Francisco, Port of Richmond, Port of Redwood City, and the Port of Benicia (private).

- **Port of Oakland:** Located in Alameda County on the eastern shore of San Francisco Bay, the Port is 300 nautical miles closer to Asia, the Port's major trading partner, than the southern California ports and is an economic engine for the region. The port is an international gateway with major trading partners such as Japan, China, South Korea, Taiwan and Hong Kong. It was designated as one of fourteen National Strategic Ports (NSP) by the U.S. Department of Defense, because it plays a critical role in the logistics transfer of our military overseas and has the necessary infrastructure to provide rapid military deployment. The Port owns Oakland International Airport, commercial properties and development (Jack London Square), and has hundreds of acres of public parks and conservation areas.
- **Port of San Francisco:** This port is known for having the largest floating drydock dedicated to ship repair on the West Coast of the Americas. It offers full-service ship repair for commercial and government vessels and can even accommodate ships larger than can fit through the current Panama Canal locks. It is also home to the cruise industry, generating approximately $30 million annually in direct economic benefit and supporting hundreds of jobs.
- **Port of Richmond:** This deepwater port is located approximately nine miles northeast of the Golden Gate Bridge in Contra Costa County on the east shore of San Francisco Bay in Richmond. Currently, of the ports in the Bay Area, Richmond ranks #1 in liquid bulk and automobile tonnage. The port has five city-owned terminals and ten privately-owned terminals for handling bulk liquids, dry bulk materials, vehicle and break-bulk cargoes; but it does not handle containers.
- **Port of Redwood City:** The only deepwater port in southern San Francisco Bay, this port is located in San Mateo County, approximately 25 miles southeast of San Francisco. This self-supporting port, owned by Redwood City, receives no tax dollars. Approximately 75 percent of port's revenue is from marine activities and the remainder is from rent and commercial leases. The port handles mostly dry-bulk, neon-bulk, and liquid bulk cargoes. Land uses at the port mainly consist of handling, processing, storage and transportation of imported construction materials, scrap metal exports, construction debris for recycling, and chemicals.

- **Port of Benicia:** This port, located in Solano County on the northern bank of the Carquinez Strait approximately 19 miles northeast of the Port of Oakland, is privately-owned and operated by APS West Coast, Incorporated. When the Benicia Arsenal Base was closed, city leaders converted the grounds into an industrial park which includes the Valero Benicia Refinery. The port specializes in handling bulk products such as agricultural products and motor vehicles. AMPORTS, a leader in the vehicle processing industry, operates a vehicle processing facility there.

M-580 Marine Highway Corridor

In 2010, the U.S. Department of Transportation awarded a $30 million Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant to the Ports of Oakland, Stockton, and West Sacramento to develop a container-on-barge service between the ports, known as the M-580 Marine Highway. Service between the Ports of Oakland and Stockton began in 2013. The Port of Stockton currently operates the service using two barges which were modified to handle containers. The purpose of the project was to provide a viable marine highway (short sea shipping) alternative to decrease congestion on major roadways such as the I-580 corridor, thereby reducing the amount of truck emissions and improving traffic flow.

AIRPORTS -CARGO

Typically, air cargo travels in the lower level of passenger planes (as "belly cargo") or on all-cargo (freighter) airlines. These services rely on networks and allied services generally only available at larger international gateways. The three commercial cargo airports in the Bay Area Region are:

- Oakland International (OAK)
- San Francisco International (SFO)
- Norman Y. Mineta San Jose International (SJC)

Oakland International Airport serves as the principal domestic air cargo airport for the Bay region handling 52 percent of regional air cargo. The airport averages 200 flights each month and sorts over 250,000 packages every day, handling markets in the Western U.S., Canada, Hawaii, and Alaska. OAK facilitates operations for United Parcel Service (UPS) and is the Federal Express (FedEx) Super Hub. The total tonnage in 2011 was 499,365 metric tons, down 65% from 2000 levels. Southwest carries the greatest amount of belly cargo, due to the high frequency of its passenger flights which generate a fairly substantial amount of freight tonnage.

San Francisco International is the principal international air cargo airport. Like seaports, airports in the Bay Area are major international trade gateways. The 2013 California Air Cargo Groundside Needs Study noted that SFO was one of the U.S. airports most adversely impacted by changes occurring after the terrorist attacks on September 11, 2001 (9/11), partially due to domestic passenger carriers "right sizing" their fleets and switching from wide-body service to narrow-body regional jets, which substantially reduced cargo capacity. In 2012, SFO captured 55 percent of the Bay Area air cargo market, including about 95 percent of the international market. Approximately 74 percent of cargo at SFO is carried on passenger aircraft. Over 60 percent of this belly cargo is

international.[1] United Airlines is the largest carrier of international merchandise imports and the second largest carrier of exports. Future growth at SFO is projected to be primarily international air cargo.

Norman Y. Mineta San Jose Airport has also seen its cargo volumes fall dramatically from about 163,000 metric tons in 2000 to 44,000 metric tons in 2011. Part of that decline can be attributed to the universal impact of 9/11, the collapse of the regional dot-com industry, and diversion of cargo activity to SFO and OAK.

FREIGHT RAIL

Class I Railroads

Only two Class I (generating more than $433 million in annual operating revenues) railroads operate in the Bay Area and in California, Union Pacific (UP) and BNSF Railway, serving a critical role in goods movement. Rail freight activity is concentrated in the East Bay, with major UP facilities in Oakland and BNSF facilities in Richmond. Both railroads provide double stack intermodal (container) or trailer-on-flatcar (TOFC) service over the Donner route and eastward to Chicago. BNSF serves the Port customers via the Tehachapi route, which ties into their transcontinental route serving Chicago, Kansas City, and Memphis.

Two major rail projects that are partially funded through the voter approved Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006, Trade Corridors Improvement Fund (TCIF) program are currently under construction. Details follow:

- The ***Richmond Rail Connector*** project includes an at-grade rail connection and signal improvements between the BNSF Stockton Subdivision and UP's Martinez Subdivision near San Pablo, just north of Richmond. The project is needed to accommodate and better serve both current and future freight traffic on the corridor while reducing the impacts to the local community by reducing congestion, air emissions and noise in downtown Richmond.
- The ***Outer Harbor Intermodal Terminal (OHIT)*** project is critical to the transformation of the Oakland Army Base (OAB) Gateway Development Area into a world-class intermodal trade and logistics center. The construction of a new intermodal rail terminal capable of handling increased container cargo-based transfers is a key component of OHIT. Trains accessing the Port's Joint Intermodal Terminal must currently cross through the UP's yard, requiring all trains accessing the Port to slow to no more than 5 miles per hour, causing significant delays to both BNSF and UP operations. By eliminating this conflict, the freight operations will be improved, with spillover benefits for the 60 passenger trains (commuter and Amtrak) that pass by the port every day and share the rail corridor.

Short Line Railroads

Short line railroads play a vital role in moving freight to and from California regions and local communities. Short lines in the Bay Region include the following:

- **Oakland Terminal Railway (OTR)** is jointly owned by UP and BNSF Railway and operates ten miles of switching track in Oakland.
- **Richmond Pacific (RPRC)** is a privately held company that operates 2.5 miles of track in the Port of Richmond and interchanges with UP and BNSF Railway.
- **San Francisco Bay Railroad (SFBR)** is independently owned and operated, running rail terminals in both San Francisco and Richmond. It operates five miles of track along the southern waterfront of the Port of San Francisco and interchanges cargo with UP.
- **California Northern (CFNR)** operates 261 miles of track and interchanges with Northwestern Pacific Railroad Company. Most of the major commodities carried are food related, including tomato products, olives, rice, cheese, frozen foods, beer, wine and wheat.

[1] Caltrans, California Air Cargo Groundside Needs Study, July 2013.

- **Northwestern Pacific Railroad Company (NWP)** is an independently-owned short line company that operates freight service from the CFNR to Windsor, California over 62 miles of main line track between Lombard (Napa County) to Windsor (Sonoma County).
- **Napa Valley Railroad (NVRR)** is an independent rail company which mainly operates as a passenger excursion train between Napa and St. Helena, but occasionally runs freight trains carrying agricultural products.

MODAL AND SYSTEM PERFORMANCE

- The predominant demand by weight in the Bay Area continues to be intraregional commodity flows.
- Continued outward dispersion of industrial activities due to existing land use polices and escalating Bay Area real estate prices makes it challenging to expand port, rail, and air cargo freight facilities. As freight activities move eastward, increases in truck travel time (distance and delay) will contribute to negative economic and environmental impacts.
- In the San Francisco Bay Area, a 0.5 meter sea level rise would have 120 miles of highway at risk (Pacific Institute, July 2012). The Ports, SFO, and OAK as well as bridge clearances and access routes are also vulnerable to flooding from sea-level rise.
- Higher transportation costs translate into higher costs of goods and living in Bay Area.
- Declines in South Bay/Silicon Valley industrial land availability creates a risk of losing high-tech manufacturing to other parts of the U.S. and the world.
- High volumes of fast growing international cargo trade places strain on the region's overburdened and outdated infrastructure.

FREIGHT INFRASTRUCTURE NEEDS

Freeway Gaps, Major Highway Bottlenecks and Corridor Improvement Strategies

- There are large gaps in the highways connecting the San Francisco-Oakland Bay Bridge western terminus (I-80) with the southern terminus of the Golden Gate Bridge and US 101 through San Francisco.
- In addition to the I-80/I-580/I-880 distribution structure at the San Francisco-Oakland Bay Bridge, there is also congestion at the I-880/I-238 and I-80/SR-12 interchanges, and along the Altamont Pass (I-580), a chokepoint for passenger and freight vehicles.
- **Corridor Improvement Strategies**
  - I-880 corridor improvement strategies include: addressing bottlenecks, implementing Intelligent Transportation Systems (ITS) where applicable, correcting older interchanges design deficiencies, and improving parallel arterial street connections.
  - Complete improvements at the I-80/I-680/SR-12 interchange.
  - An east bound truck scale facility was recently completed and a new west bound truck scale in the same general vicinity is being planned for I-80 in Solano County.
  - Upgrades on SR-152 between US 101 and the eastern Santa Clara County line including realignment of SR-152 and an eastbound truck climbing lane over Pacheco Pass.
  - Various operational improvements between San Jose and San Francisco on US 101.

Port Issues

- Freight congestion (capacity, safety, and bottleneck issues on I-880, I-580, I-238 and I-80)
- Limited capacity and intermodal connections – port capacity and infrastructure have not kept pace with demand
- Growth in containerized cargo, population, and the economy is expected to generate substantial truck traffic and air quality issues near airports and seaports
- North-south freight rail capacity increases are needed at the Port to alleviate bottlenecks

- Seaport security
- Secure funding and financing for needed maintenance and improvements
- Return and equitable dispersion of Harbor Maintenance Tax Funding based on contribution for navigation maintenance and channel dredging

ENVIRONMENT

One of the region's main concerns is that increases in truck emissions could threaten the Bay Area's air quality conformity goals. Trucks are the major contributors to increased emissions of particulate matter (PM) (currently: truck 57%, marine 25%, air 12%, and rail 6%) and nitrogen oxide (NOx) (currently: truck 73%, air 11%, marine 9%, rail 7%). The Metropolitan Transportation Commission (MTC) Plan Bay Area (RTP through 2040) integrates transportation, land use, and sustainability in response to Senate Bill 375. The U.S. Environmental Protection Agency (USEPA) new emission mitigation standards for heavy-duty diesel aim to reduce emissions for NOx and PM by 90 percent.

The California Air Resources Board set emissions reduction targets for the Bay Area. Relative to a base year of 2005, the targets represent a 10 percent per-capita reduction by 2020 and a 15 percent per-capita reduction by 2035. However, the region is projected to increase from 7 million to 9 million people which means the region will be challenged to accommodate a nearly a 30 percent increase in population by 2040 while still meeting emission targets.

Ways to mitigate parking and idling by large commercial trucks in socially and/or economically disadvantaged neighborhoods (due to lack of parking at ports) is warranted for local and regional good. Reuse of land located within the vicinity of the ports should be considered and given priority for industries that are part of the warehouse and supply chain distribution channels. The region should also continue working on ways to divert freight from truck to rail.

REGIONAL AND LOCAL TRANSPORTATION PLANNING AGENCIES

- Alameda County Transportation Commission (ACTC)
- Association of Bay Area Governments (ABAG)
- Bay Area Air Quality Management District (BAAQMD)
- Contra Costa Transportation Authority (CCTA)
- Metropolitan Transportation Commission (MTC)
- Napa County Transportation Planning Agency (NCTPA)
- San Francisco Bay Conservation and Development Commission (BCDC)
- San Francisco County Transportation Authority (SFCTA)
- City/County Association of Governments of San Mateo (CCAG)
- Santa Clara Valley Transportation Authority (VTA)
- Solano Transportation Authority (STA)
- Sonoma County Transportation Authority (SCTA)
- Transportation Authority of Marin (TAM)

PLANS AND DOCUMENTS

"Plan Bay Area," adopted in 2013, is one of the region's most comprehensive planning efforts to date and was a joint effort of nine counties, 101 cities, four agencies (ABAG, MTC, BAAQMD, and BCDC), and others. Following is a list of various freight-related plans and documents.

BAY AREA REGION PLANS & STUDIES	SPONSOR	DATE	WEBSITE
Regional Goods Movement Study for	MTC	Dec	http://www.mtc.ca.gov/planning/rgm/

BAY AREA REGION PLANS & STUDIES	SPONSOR	DATE	WEBSITE
the SF Bay Area–Final Summary Report		2004	
Goods Movement Emissions Reduction program for Transportation 2035	BAAQMD	2011	http://www.baaqmd.gov/
Goods Movement Initiatives	MTC	2009	http://www.mtc.ca.gov/planning/2035_plan/Supplementary/T2035_Goods_movement_update.pdf
Goods Movement Land Use Project for San Francisco Bay Area	MTC	Dec 2008	http://www.mtc.ca.gov/planning/rgm/final/Final_Summary_Report.pdf
Plan Bay Area – Regional Transportation Plan	MTC	2013	http://onebayarea.org/plan_bay_area/
West Coast Corridor Coalition (WCCC) Business Plan – (Alaska, Washington, Oregon, and California)	WCCC	April 2009	http://www.westcoastcorridors.org/library/WCCC_BusinessPlan.pdf
Port of Oakland – Maritime Comprehensive Truck Management Program	Port of Oakland	June 2009	http://www.portofoakland.com/pdf/CTMP_final_090616.pdf
Port Activity and Competitiveness Tracker (PACT) Progress Report	Southern California Association of Governments	Feb 2011	http://www.gensteam.com/resources/reports/Liner%20Trades-West%20Coast%20Port%20Analysis.pdf

PARTNERSHIPS

- Alameda Corridor-East Construction Authority
- Association of Bay Area Governments
- Bay Area Air Quality Management District
- Bay Conservation and Development Commission
- California Air Resources Board
- California Airports Council
- California Association of Councils of Governments
- California Association of Port Authorities
- California High-Speed Rail Authority
- California State Transportation Agency
- California State Association of Counties
- California Transportation Commission
- Federal Highway Administration
- Ports of Oakland, San Francisco, Richmond, Redwood City, Benicia, and Stockton
- U.S. DOT Maritime Administration

RESOURCES AND ADDITIONAL INFORMATION

Air Cargo Mode Choice and Demand Study (2010), prepared for Caltrans by TranSystems – http://www.dot.ca.gov/hq/tpp/offices/ogm/key_reports_files/Air_Cargo_Mode_Choice_&_Demand_Study_080210.pdf

Alameda County Transportation Commission (ACTC) – http://www.alamedactc.org

American Association of Port Authorities (AAPA) – http://www.aapa-ports.org/home.cfm

Association of Bay Area Governments (ABAG) – http://www.abag.ca.gov/

Bay Area Air Quality Management District (BAAQMD) – http://www.baaqmd.gov/

California Air Cargo Groundside Needs Study, prepared for Caltrans by System Metrics Group and Landrum and Brown, July 2013 – http://www.dot.ca.gov/hq/tpp/offices/ogm/air_cargo.html

California Air Resources Board – http://www.arb.ca.gov

Caltrans Office of Truck Services / Maps – http://www.dot.ca.gov/hq/traffops/trucks/

Impacts of Sea-Level Rise on the California Coast, Herberger, Matthew, Cooley, Heather, Herrera, Pablo; et. al. California Climate Change Center, 2009 – http://www.mtc.ca.gov/planning/climate/sea_level_report.pdf

Marine Highway Program – http://www.marad.dot.gov/ships_shipping_landing_page/mhi_home/mhi_home.htm
Metropolitan Transportation Commission (MTC) – http://www.mtc/ca/gov
Regional Goods Movement Study for the San Francisco Bay Area (2004), MTC – http://www.mtc.ca.gov/planning/rgm/
Port of Benicia – http://www.amports.us/
Port of Oakland – http://portofoakland.com/
Port of Redwood City – http://www.redwoodcityport.com/
Port of Richmond – http://ci.richmond.ca.us/
Port of San Francisco – http://www.sf-port.org/
Transportation Investment Generating Economic Recovery (TIGER) Grants, U.S. DOT, February 17, 2010 – http://www.dot.gov/documents/finaltigergrantinfo.pdf
World Port Source – http://www.worldportsource.com/ports/USA_CA_Port_of_Oakland_231.php